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Remarks1) Summary of The Office Action

Claims 2 – 48 were pending in the case.

Claims 29, 30 and 36 – 45 have been allowed.

Claims 2 – 28, 31 – 35 and 46 – 48 stand rejected under 35 USC 103.

2) Claim Amendments

The applicant has cancelled claims 2 – 10 and 46 - 48, for the purposes of better placing this application in a condition for allowance or appeal, without prejudice to further prosecution of those claims by way of continuation or division, as may be appropriate. The applicant traverses all of the rejections of these claims 2-10 and 46-48.

With regard to the rejection of claims 31 – 35, the applicant believes that the current rejection may be founded on a misunderstanding of the illustrations in US Patent 4,951,575 of Dominguez. This is discussed below.

The applicant also believes that the rejection of claim 11 given Dominguez '575 in light of Beals '963 may be based on a misperception concerning the nature of the Beals '963 railcar.

Aside from the two issues of interpretation of drawings in Beals and Dominguez '575, the cancellation of claims 2 – 10 and 46 - 48 is intended to permit prosecution to focus solely on the issue of "design choice", which forms the ground of rejection of independent claim 11, and many of the dependent claims pending in this application.

3) Claim Rejections Under 35 USC 112

There are no outstanding rejections under 35 USC 112.

4) Claim Rejections Under 35 USC 102

There are no outstanding rejections under 35 USC 102

5) Claim Rejections Under 35 U.S.C. 103 – Obviousness - Law

In the interest of brevity, the applicant hereby includes, by reference, the statements of the law made in the Response to Office Action of June 10, 2002.

6) Application of Law To Rejections Under 35 USC 103

Other than claims 31 – 35, the remaining claims that stand rejected in this case, namely claim 11 and claims dependent therefrom, are rejected on the basis that the Examiner alleges that it would be obvious to modify the principle reference, US Patent 4,951,575 of Dominguez et al., (hereinafter “Dominguez ‘575”) in light of US Patent 5,943,963 of Beals (hereinafter, “Beals ‘963”) and the knowledge of persons skilled in the art, to arrive at the claimed invention. Specifically, in the Examiner’s view, the remaining modification required is a matter of “design choice”.

The applicant respectfully traverses this rejection.

7) Commentary re: Combination of Dominguez ‘575 in Light of Beals ‘963

The Examiner has written:

“Dominguez et al., as set forth above, does not disclose the use of a center beam railroad car that has first and second end bulkheads that extend to a greater height relative to said central beam assembly.”

“Beals discloses a railroad flat car with a pair of end bulkheads, as shown in Figure 1, that extend to a greater height than a load that is stacked onto the bed of said flat car, as well as any load supports that may be provided on said flat car, such as a central beam assembly.”

The applicant respectfully submits that to make the rejection sought to be made by the Examiner, it would be a necessary (but not necessarily sufficient) condition that Beals ‘963 show the feature identified by the Examiner as being missing from the principal reference, namely “first and second end bulkheads that extend to a greater height relative to said central beam assembly.”

The problem is, Beals ‘963 doesn’t actually show a “central beam assembly” at all.

Beals ‘963 has three Figures. Figures 2 and 3 do not show a railcar. Figure 1 shows

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what appears to be a plain bulkhead flat car, without a center beam assembly, with a load of lumber strapped on the deck. This impression is reinforced by the representation of the depth of the center sill in Figure 1. If the car has a center beam assembly, it must be hidden by the lumber. But if it is not visible in the drawings, and isn't described in the text, then its existence is a matter of conjecture. Establishment of *prima facie* obviousness under 35 USC 103 requires proof in the reference of the actual feature, not merely conjecture that the feature might exist.

Therefore, Beals '963 cannot show bulkheads that extend to a greater height than the central beam assembly, because Beals '963 doesn't appear to have, let alone show, a central beam assembly. As such, even taken in combination, Dominguez '575 and Beals '963 do not show all of the features of the claim (even leaving aside, for now, the issue of "design choice"). Therefore, the applicant respectfully submits that Beals '963: (a) does not supply the missing feature sought by the Examiner; and (b) does not provide grounds to establish *prima facie* obviousness under 35 USC 103.

Nor can we assume that combining the bulkheads of Beals '963 with the center beam assembly of Dominguez '575, would lead successfully to the claimed invention, since (a) Dominguez' '575 center beam appears to be a full height center beam, judging by Dominguez' bulkheads; and (b) there is no way to judge the relative heights of the Beals '963 and Dominguez '575 bulkheads, i.e., for all we know, they might be the same height, or Dominguez' bulkheads might actually be taller.

Further still, there is no apparent reason why one would combine the central beam assembly of Dominguez '575 with the bulkheads of Beals '963, even if those bulkheads did exceed the height of Dominguez' central beam assembly, because there is no indication of any advantage to be gained by doing so in either of the references.

The applicant submits that *prima facie* obviousness has not been established under 35 USC 103, on the basis of Dominguez '575 and Beals '963, whatever else may be a "design choice" or not.

8) Principal Reference Teaches Against Modification

Even if Beals '963 had provided the missing feature sought by the Examiner, the applicant submits that there would still be insufficient grounds to reject claim 11 as a "design choice", since the principal reference teaches away from the posited "design choice" in any event.

The Examiner's rejection as a matter of "design choice" is made in the context of modifying the principal reference, Dominguez '575, in light of Beals '963 (discussed above) to include the recited step height feature of claim 11.

As a preliminary matter, the applicant denies that the modification is a "design choice", but rather it is a modification that may facilitate loading and unloading of the cars.

Even if the concept of "design choice" were otherwise established as a ground for rejection, that would still not overcome a teaching in the principal reference against the modification. That is to say, the applicant submits that, as a pure issue of law, if the principal reference teaches against the modification, the issue of "design choice" does not arise.

In this case, Dominguez '575 teaches against the modification. Therefore, it cannot be a matter of "design choice": Dominguez '575 tells us not to do it.

How do we know this ?

Because Dominguez tells us.

I) Dominguez' Desires & Objectives

- (a) "... the high center of gravity of the loaded car in the prior art produces relatively poor trackworthiness and ride stability. Therefore, it is desirable to provide center beam/center partition cars that not only provide greater efficiency, but also demonstrate greater stability during loading/unloading and when being transported." (Col. 1, line 64 – col. 2, line 2).
- (b) "It is an objective of the present invention to provide an improved center beam flat car of depressed center design demonstrating enhanced operating efficiency and greater stability in use." (Dominguez, col. 2, lines 5 – 8)

II) How Does Dominguez Propose to Reach his Objectives ?

Dominguez says:

- (a) "The depressed loading area of the depressed center beam car herein disclosed also significantly *increases the available volumetric capacity* for loading modules and also *substantially lowers the center of gravity* of empty and fully loaded cars." (Col. 2, lines 21-27, Emphasis added)
- (b) "The depressed section for carrying loads thus results in an *additional carrying capacity* over known cars of approximately 26,460 pounds for lumber having a density of 31.5 pounds per cubic feet. Thus, the payload carrying efficiency is

196,560/200,000 or 98.3% which achieves an efficiency of over 15% over current center beam/center partition cars. It is also estimated that incorporation of the depressed floor section of the invention will decrease the loaded car center of gravity in the range of ten to fourteen inches. The reduced center of gravity decreases the probability of the car tipping over during the loading/unloading cycles and significantly improves the track worthiness and ride stability of the car." (Col. 2, lines 36-49, Emphasis added)

In summary,

Dominguez states two objectives:

- (i) enhanced operating efficiency; and
- (ii) greater stability in use.

To reach these two objectives:

- (i) Dominguez seeks to enhance operating efficiency by increasing the volumetric capacity of the car; and
- (ii) Dominguez seeks to improve track worthiness and ride stability by lowering the center of gravity of the laden (and unladen) car.

II) How is the Step Height Determined ?

The step height δ is determined by subtracting the height of the lower deck (H_{Low}) from the height of the upper deck (H_{Upper}), both heights being measured relative to the common datum of Top of Rail. Arithmetically, $\delta = H_{Upper} - H_{Low}$.

It is mathematically inescapable that to increase δ , one must either (a) lower the lower deck; (b) raise the upper deck; or (c) both (a) and (b).

If the lower deck cannot go any lower, then it is equally inescapable that to increase step height, the end deck portion must be raised.

III) How Big is Dominguez' Step ?

Dominguez '575 tells us that the mid-portion of his deck is 14 – 18 inches lower than the end portions (col. 4, line 35).

IV) Could Dominguez' Mid-portion Have Been Lower ?

Given his stated objectives, if Dominguez '575 could have lowered the middle portion of

his deck any lower, it is reasonable to think that he would have done so, since that would have lowered his center of gravity, and might have increased the payload efficiency or volumetric capacity of the car. Any other action would have been inconsistent with at least one or another of his own stated objectives.

Put conversely, why would Dominguez '575 have left the center of gravity any higher than it needed to be? To do so would have been contrary to his own stated desires.

V) Unreasonable to Assume Dominguez was Incompetent

If Dominguez said that he wanted to lower the center of gravity, and wanted to increase payload efficiency, the only reasonable inference is that he did his best to achieve those results.

To obtain the step height of claim 11, namely, at least 30 inches, without raising the end deck portions of the car would mean that Dominguez would have had to achieve a step height at least 12 inches greater than the 18 inches Dominguez indicates.

It is not reasonable to assume that although Dominguez expressed a desire to lower the C of G of the car, nonetheless Dominguez was so poor an Engineer that he missed by at least 12".

The applicant submits, that given Dominguez' stated objectives, the only reasonable inference is that if Dominguez could have made the deck lower to reduce the height of the C of G or to increase lading capacity, he would have. Therefore, the applicant submits that a person skilled in the art, reading Dominguez, would reasonably infer that Dominguez' deck was about as low as Dominguez could get it. The Examiner has not pointed to anything in Dominguez that suggests otherwise.

The applicant notes that the difference in step height between the claimed invention and the step height indicated in Dominguez is not a relatively minor amount of 1/8", or 1/4", or even 1" in depth, such as might perhaps be squeezed out of a design by shaving dimensions here and there. The difference of claim 11 over Dominguez (12+" - 16+") is almost as large again as the step height actually described by Dominguez (14" - 18"). This is not a trivial amount.

For further support for this conclusion, note that Dominguez' end decks roughly correspond to the top of the coupler pocket (see Fig. 1). In an unladen car with new wheels this might yield a deck height of 41 - 42". The car body must always be at least 2 3/4" clear of TOR.

Spring deflection would be about 2 - 2-3/8" (+/-) from the light car (empty) condition to the fully loaded condition. With 50 % reserve travel, based on a static deflection of the springs for a 63,000 lb car of 1/2 - 5/8" (+/-), this yields about 3 1/4" for spring travel. Subtracting, 42 - 33 5/8 - 2 3/4 - 3 1/4 = about 2 1/2". This is the height remaining for the depth of the deck, side sills, and cross-bearers, before allowance for (a) sweep on curves, (b) the narrowing of the underframe envelope; and (c) structural deflection under load. The applicant submits that even from this cursory estimate it appears that to obtain a 30" or 33-5/8" step it would seem necessary to raise the end deck portions, and probably by quite a fair bit.

VI) Raising the End Decks is Only Remaining Choice

As noted above, to increase the step height, there are only two possible choices: (1) lower the middle portion of the deck; or (2) raise the end portion of the deck.

By process of elimination, to arrive at the invention of claim 11, if the deck can't go any lower, the only remaining option would be to modify Dominguez by raising the load supporting interface of the end decks.

VII) What Are the Consequences of Raising the End Decks ?

The applicant has provided a sketch for the Examiner's convenience, labelled "Explanatory Sketch No. 1".

(i) Concerning Center of Gravity

Consider two possibilities: either (a) the same lading is carried on the first end deck portion as on the second end deck portion; or (b) both end deck portions are jammed full. Note that, in both cases, the height of the middle portion of the deck is the same, H_{Low} , measured from the reference datum of Top of Rail. The heights of the upper decks are identified as H_{Upper1} , or H_{Upper2} , respectively. The step heights are defined as follows:

$$\delta_1 = H_{Upper1} - H_{Low} \quad \text{and} \quad \delta_2 = H_{Upper2} - H_{Low}$$

If the end deck step height is increased, from δ_1 on the right hand side of the sketch, to δ_2 on the left hand side of the sketch, it can be seen that the remaining available lading height shrinks from $H_{available1}$ to $H_{available2}$.

(a) First Possibility: Same Load on Each Deck

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Sketch No. 1 shows two identical rectangles in phantom lines, each having a depth 'D' and a width 'W'. It is clear from the illustration that the center of gravity C_2 of the rectangle on the left hand side is higher than the center of gravity C_1 on the right hand side, by the amount of the difference in step heights, $\delta_2 - \delta_1$.

Therefore, even assuming that the rest of the car is laded exactly as before, (i) the center of gravity of the second rectangle must be higher than the center of gravity of the second rectangle, and therefore (ii) the overall center of gravity of the lading on the entire car is now higher than it was by some increment.

Note that this will be true, whatever dimensions are chosen for 'D' and 'W' within the available lading envelope.

(b) Second Possibility: Both Decks Jammed Full

Now suppose that both the right hand and left hand decks are jammed full over their entire available loading heights, $H_{available1}$ and $H_{available2}$, respectively. In this case, the center of gravity of the load on the left hand end deck is O_2 , and the center of gravity of the load on the right hand end deck is O_1 . O_2 lies at a greater height than O_1 . The arithmetic difference in height is equal to one half of the difference between δ_2 and δ_1 .

The Examiner may note that the end deck portion now carries less lading. But the overall C of G of the entire load will have risen incrementally because lading is, in, effect, being removed from a location low down on the car, well below the overall C of G. Thus, the remaining C of G must be higher than before, by some incremental amount.

Conclusion re: Center of Gravity

Thus, we can conclude that raising the end deck portions raises the loaded center of gravity of the car. We can also observe that, whatever else Dominguez may have taught, Dominguez did not encourage raising the center of gravity of the laden car. Quite the contrary.

(ii) Payload Efficiency/Volumetric Capacity

If the end deck is raised, the best that can be achieved is for the payload efficiency to stay the same. However, it may get worse. Consider three situations:

(a) Suppose Raising End Deck Raises Center of Gravity Past 98" Limit

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If the end deck is raised far enough, the overall center of gravity for the laden car may exceed the 98" limit relative to Top of Rail. In that case, lading must be removed from the upper region of the car until the C of G is again below 98".

If lading is removed, the payload efficiency must decrease, contrary to Dominguez' desire and objective.

(b) Suppose End Deck Raises Top of Load Past Lading Height Limit

If raising the end deck raises the lading height past the lading height limit, then, again, lading must be removed from the top of the load until it no longer exceeds the lading height limit. As above, if lading is removed, the payload efficiency must decrease, contrary to Dominguez' stated desires and objectives.

(c) Suppose Raising End Deck Neither Raises C of G Past 98" Limit, Nor Raises Lading Past Lading Height Limit

In this case, the payload efficiency will remain as before. However, for a low density material that does not approach the GRL, or the C of G limit, raising the end deck portion will, necessarily, decrease the volumetric capacity of the lading envelope as measured between the level of the deck and the lading height limit.

Conclusion re: Payload Efficiency/Volumetric Capacity

The best that can be achieved is for the payload efficiency to stay the same as before, and even then, the volumetric capacity of the car, as measured by the volume of the lading envelope lying between the deck and the lading height limit, will decrease. Further, if either the 98" C of G limit is exceeded, or the lading envelope height limit is exceeded, the payload efficiency will decrease by the reduction in payload required to fall back within those limits.

Given that the idea, generally speaking, is to lade the car as heavily as possible up to the Gross Rail Load (GRL), it is, again, reasonable to assume that Dominguez did the best he could to approach the maximum GRL without exceeding either the lading height limit or the 98" C of G limit. Therefore it may also be inferred that, presumably, Dominguez could not lade his car any further without breaching one or another of those limits, otherwise he would have.

Again, given Dominguez' expressed objectives and desires, there does not appear to be a reasonable basis for supposing otherwise.

Overall Conclusion re: Raising the Height of the End Deck Portions

However calculated, raising the end deck will, for the same amount of lading, raise the C of G of the laden car. Further, raising the end deck portions may also decrease the payload efficiency of the car, if the lading would then exceed the height limit or the 98" C of G limit. In the event that the applicant is mistaken in this analysis, the applicant respectfully requests that the Examiner demonstrate the fault in this logic.

Conclusion: Dominguez '575 Teaches Against Raising the Deck End Portions

It follows from the foregoing, that raising the end portions of the deck would appear to work against Dominguez' goals and objectives, at least to the extent that it raises the C of G, and may decrease the lading efficiency and volumetric capacity.

Summary of Applicant's Argument

- (a) Claim 11 recites a step height that is at least 30 inches.
- (b) To obtain a step height of 30 inches, it appears inescapable that Dominguez '575 would have had to raise his end deck portions.
- (c) All other variables remaining constant, raising the end deck portions appears to necessitate a rise in the height of the center of gravity, and a possible reduction in either the payload efficiency or the volumetric capacity of the car.
- (d) Dominguez '575 tells us he wants to lower the center of gravity, not to raise it.

The applicant submits that the only reasonable conclusion that can be drawn is that Dominguez '575 teaches away from the presently claimed invention.

Teaching away is the antithesis of suggesting that the person of ordinary skill go in the claimed direction. See *In re Dow Chemical* 837 F.2d 469, 5 USPQ 1529 (Fed. Cir. 1988); *In re Fine* 837 F. 2d 1071, 5 USPQ 2d, 1596 (Fed. Cir. 1988).

"Design Choice"

If Dominguez '575 teaches away from increasing the step height (because it increases the height of the center of gravity, and therefore degrades the "track worthiness and ride stability" of the car), then, to the extent that they all raise the center of gravity of the car, the applicant submits that it is irrelevant whether it is alleged that a choice between 30", 33-5/8", or some other large value designated as the claimed step height is alleged to be a "design choice", because Dominguez teaches against all of them. Dominguez teaches not to raise the center of gravity of the car because that degrades track worthiness and ride stability.

To put it another way, we never arrive at the point where a discussion of "design choice" is relevant: whether it would otherwise be a "design choice" or not, Dominguez '575 teaches against doing it.

(VIII) Law Underlying Applicant's Argument:

The applicant respectfully submits that the following propositions correctly state the law governing the current rejection of claim 11:

1. The burden of rebutting a rejection under 35 USC 103 only falls on the applicant after *prima facie* obviousness has been established.
2. *Prima facie* obviousness under 35 USC 103 requires, as a necessary condition precedent, a showing of suggestion, motivation, or incentive, in the prior art to make the combination or modification proposed in the rejection.
3. There can be no suggestion, motivation, or incentive to make the modification where the prior art teaches away from the proposed combination or modification.
4. Therefore, if the prior art teaches away from the modification, a *prima facie* case of obviousness cannot be established.

If these propositions correctly state the law, as the applicant submits they do, the applicant respectfully submits that claim 11, and all claims dependent from claim 11, are presently allowable over the art of record cited in this case.

MPEP 2142 and *In re Vaeck*

The applicant refers again to MPEP 2142, and the first and third of the three branches of the test for establishing *prima facie* obviousness:

a) Suggestion or motivation to modify the reference

"The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination (*In re Mills*, 916 F.2d 680, 16 USPQ 2d 1430 (Fed. Cir. 1990)).

Whatever else Dominguez may say, there is nothing in Dominguez '575 that even remotely suggests raising the center of gravity of the car. On the contrary, Dominguez '575 desires to lower the center of gravity of the car.

b) Prior art must teach or suggest all of the claim limitations

Dominguez '575 does not teach a 30+ inch step. There is no prior art of record in this case that teaches a 30 inch step. The requirement is that there be "objective evidence of record". The applicant submits that the Examiner has not demonstrated that there is "objective evidence of record" of a car with a 30 inch (or more) step in this case. Further, even if there were, the applicant submits that Dominguez '575 would still teach away from it, negating a suggestion of combination or modification.

(IX) *In re Garratt*

The applicant's repeats the commentary made in connection with the case of *In re Garratt* previously submitted in this matter.

9) Claims Dependent from Claim 11

The applicant traverses all of the rejections of any of the claims dependent from claim 11, namely claims 12 - 26. To the extent that the Examiner has rejected these claims on the basis of "design choice" the applicant repeats the commentary made with regard to *In re Garratt* that such rejections are not properly made.

Further, the applicant explicitly denies that the features alleged to be mere "design choices"

can be classified as such. The Examiner bears the burden of showing:

- (a) that, as a factual matter, on the basis of objective evidence of record, the impugned features are merely a matter of "design choice"; and
- (b) that, whether or not the features are a matter of "design choice", on the basis of the objective evidence of record, there is a suggestion, motivation, or incentive by which a person skilled in the art would understand the desirability of making the modification proposed by the Examiner.

The applicant submits that the rejections of the office action of January 30, 2002 and August 5, 2002 do not discharge this burden. In consequence, the applicant respectfully submits that grounds for the rejections of claims, 12 - 26 under 35 USC 103 have not been established. As such the applicant submits that these claims are presently allowable.

10) Commentary Re: Claim 31 and Claims 32 - 35 Dependent Therefrom

In view of the withdrawal of claim 2, claim 31 has been re-written as an independent claim.

The Examiner has rejected claim 31, noting that there is a draft sill with a draft pocket, defined as part 22 in Dominguez Figure 5, and a draft pocket cap plate, which is shown beneath part 66 in Figure 5.

The applicant respectfully submits that the applicant believes that the Examiner is mistaken in this regard. The applicant suspects there may have been a mis-reading of Dominguez' drawings.

The applicant respectfully directs the Examiner's attention to Dominguez '575 Figures 8 and 9. The applicant specifically draws the Examiner's attention to Dominguez' center sill 6. Center sill 6 has an upper surface 8. The lateral plate having upper surface 8 is the upper flange of center sill 6. Upper surface 8 is downset from the upper edges of the side sill webs. This is clearly shown in Dominguez Figure 8. Similarly, upper surface 8 is carried at a lower height than floor sheet 40. Note that the outer edge of floor sheet 40 rests on the upper flange of side sill 28.

Now consider Dominguez '575 Figure 3. In this illustration, the upper flange of the center sill is, apparently, represented by a pair of parallel dashed lines just beneath the solid line showing the upper edge of the center sill webs. Assuming this to be correct, it will be noted that this pair of

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dashed phantom lines extends fully to the end of the draft sill 22 portion of center sill 6.

Turning now to Figure 5, the upper flange 66 of bolster 62 runs from the top flange of side sill 28, i.e., at the same level as deck sheet 40. Thus the un-numbered plate of Figure 5 lying beneath flange 66 is once again the upper flange of the center sill, and hence the upper flange of draft sill 22. Please note that, as indicated in Figure 4, Figure 5 is a view taken looking toward the bolster, not the coupler.

There is no indication in Dominguez' illustrations or text that any plate other than the upper flange lies between the webs of draft sill 22. See, for example, Dominguez' Figure 10. By process of elimination, then, we can conclude that Dominguez '575 does not show a draft pocket cap plate within the center sill end portion as claimed in claim 31.

As such, the applicant again respectfully submits that claim 31, and claims 32 - 35 dependent from claim 31, are allowable over the art of record in this case.

11) Conclusion

In view of the foregoing arguments and claim amendments the applicant submits that the claims are in a condition to permit allowance. Therefore the applicant requests early and favourable disposition of this application.

Respectfully submitted,



Stephen L. Grant

Reg. No. 33,390

Email: slgrant@hahnlaw.com

Customer No. 021324

Hahn Loeser & Parks LLP
1225 W. Market St.
Akron, OH 44313
330-864-5550
Fax 330-864-7986

Version with Markings to Show Changes Made

31. (Twice amended) A center beam rail road car comprising:

a deck structure carried by rail car trucks, said deck structure having first and second end portions and a medial portion lying between said first and second end portions, said medial portion being stepped downward relative to said end portions; first and second end bulkheads extending upwardly from opposite ends of said deck structure;

a central beam assembly running lengthwise along said rail road car between said bulkheads, said beam assembly standing upwardly of said deck structure;

[The center beam rail road car of claim 2 further comprising;]

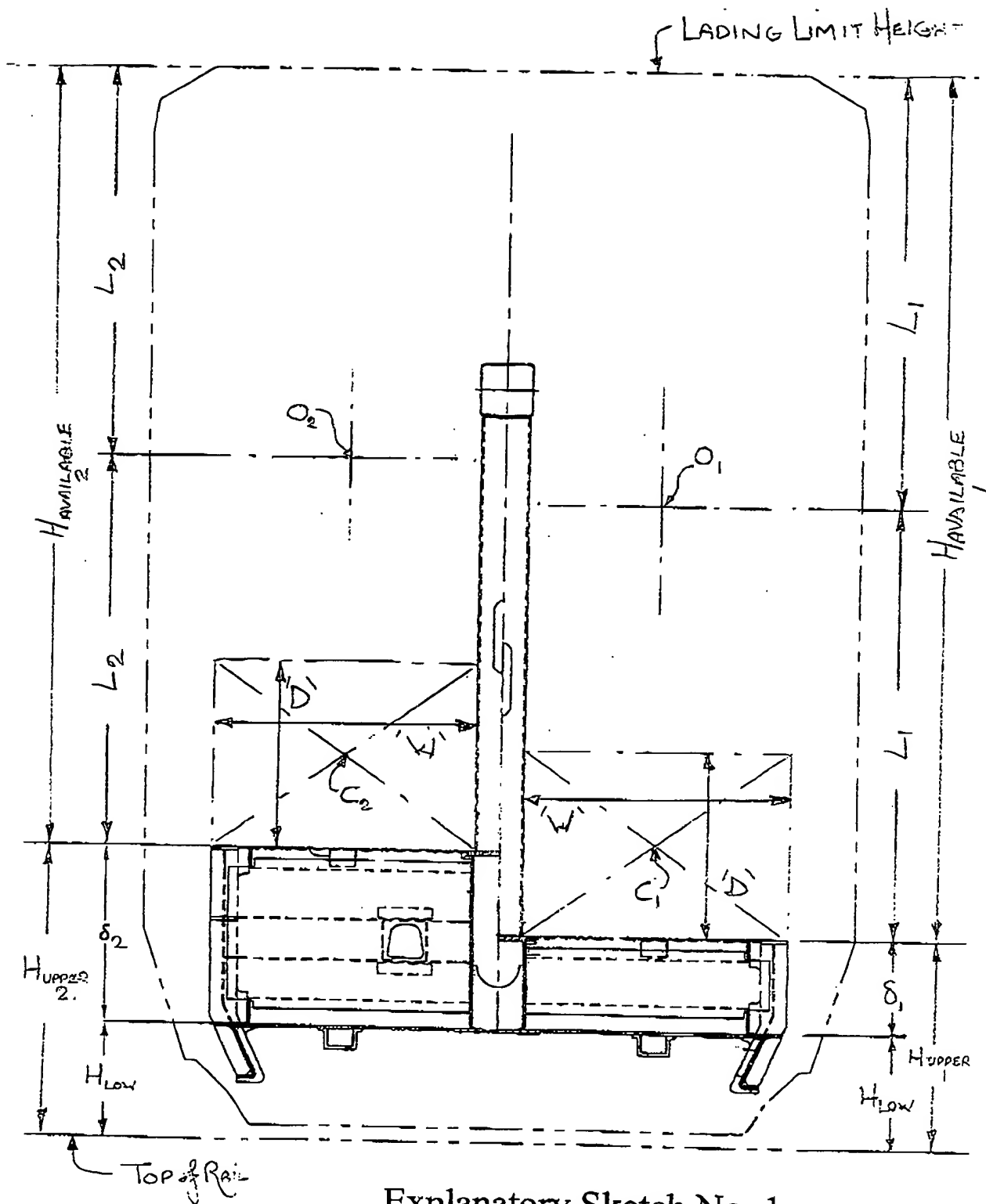
a center sill running along said deck structure;

said first end portion of said deck structure having a first end deck sheet;

said center sill having a first center sill end portion, said center sill end portion having an upper flange and a pair of spaced apart webs extending downwardly from said upper flange;

a draft pocket cap plate mounted within said first center sill end portion between said pair of spaced apart webs, said draft pocket cap plate lying at a lower level than said deck sheet; and

a draft pocket defined between said pair of webs and below said draft pocket cap plate.



Explanatory Sketch No. 1